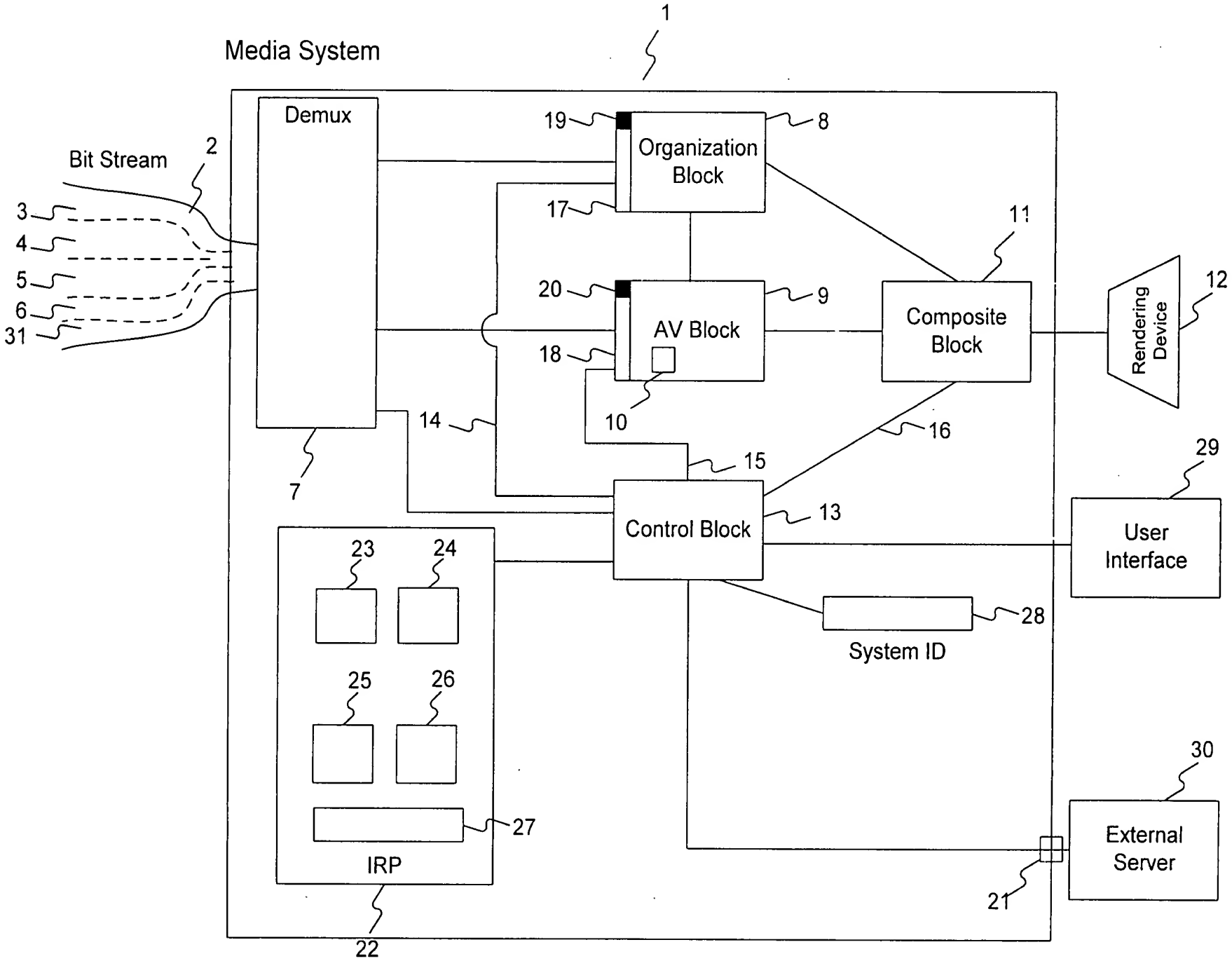


Fig. 1

09276233.032500

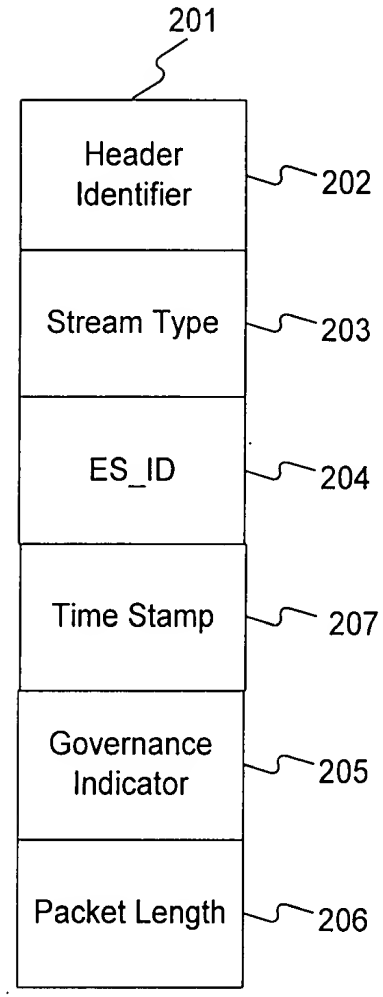

201
Header Identifier
202
Stream Type
203
ES_ID
204
Time Stamp
207
Governance Indicator
205
Packet Length
206

Fig. 2

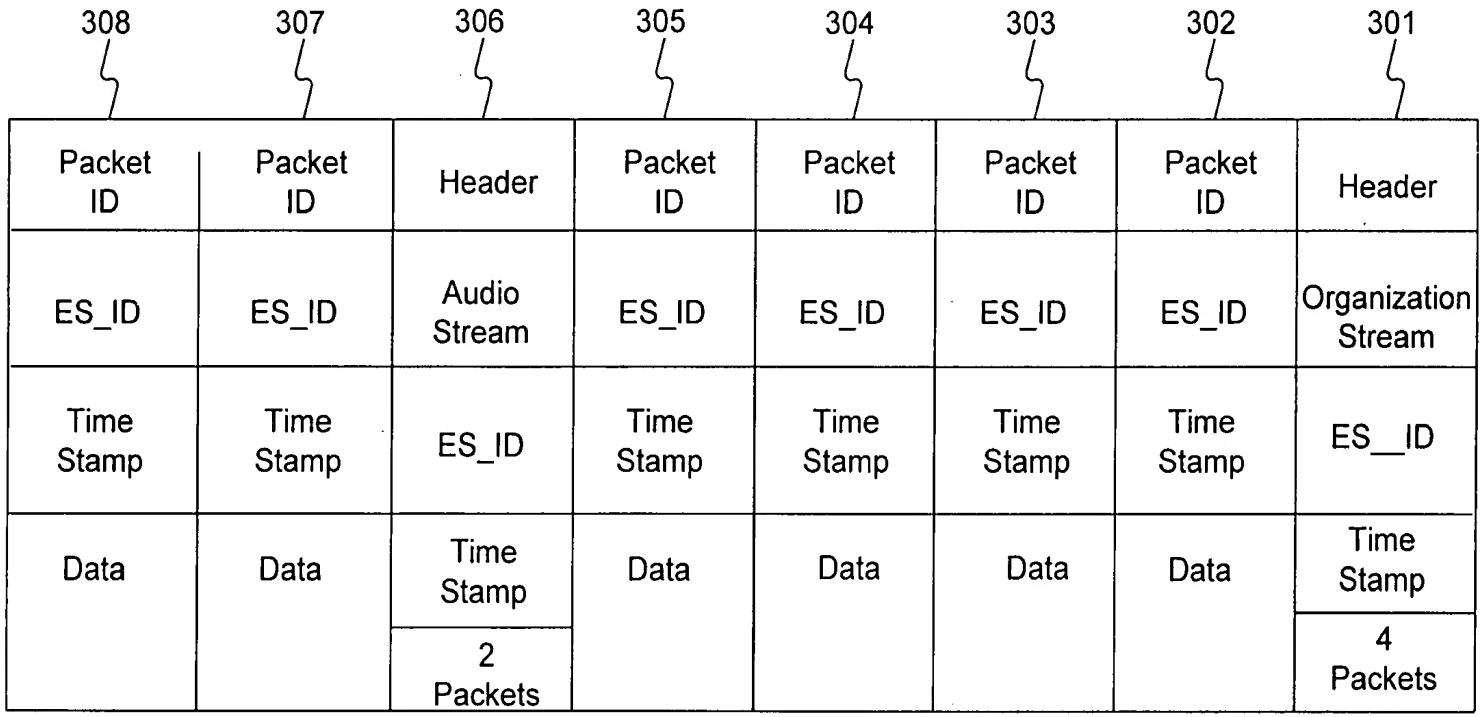

308
307
306
305
304
303
302
301
Packet ID
Packet ID
Header
Packet ID
Packet ID
Packet ID
Packet ID
Header
ES_ID
ES_ID
Audio Stream
ES_ID
ES_ID
ES_ID
ES_ID
Organization Stream
Time Stamp
Time Stamp
ES_ID
Time Stamp
Time Stamp
Time Stamp
Time Stamp
ES__ID
Data
Data
Time Stamp
Data
Data
Data
Data
Time Stamp
2 Packets
4 Packets

Fig. 3

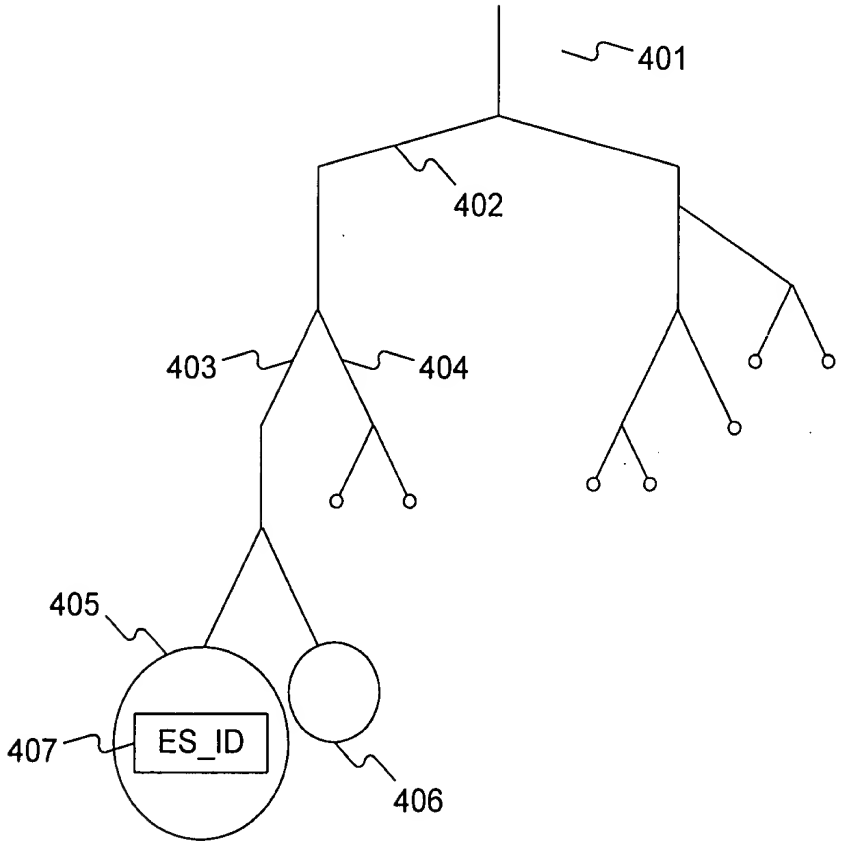


Fig. 4

09276233 .032599

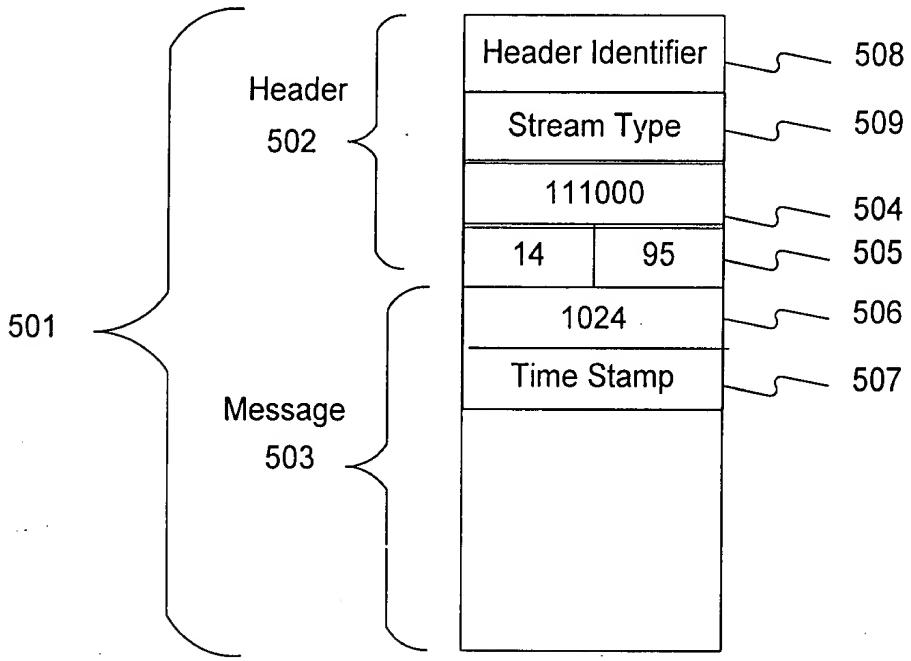

Control Message
501
Header
502
Message
503
Header Identifier
508
Stream Type
509
111000
504
14
95
505
1024
506
Time Stamp
507

Fig. 5

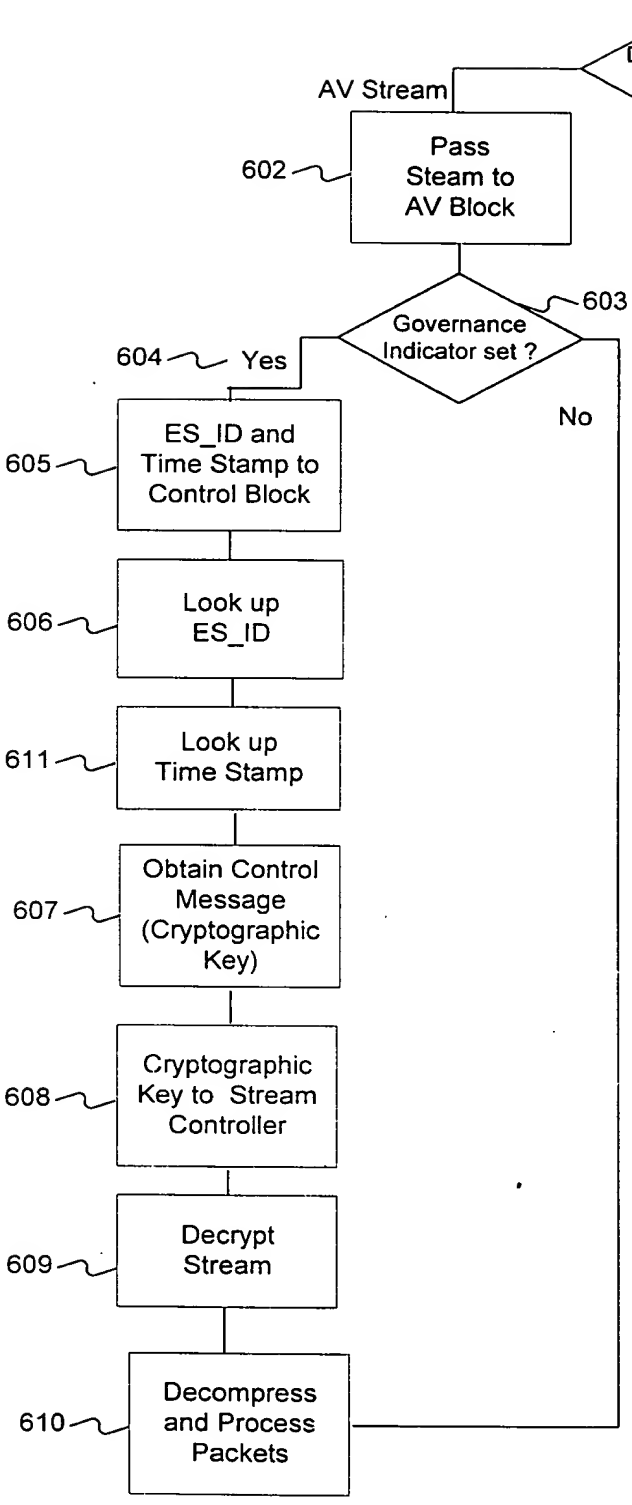


Fig. 6

P:\ThayerL\07451int\0011\figures\figs.vsd

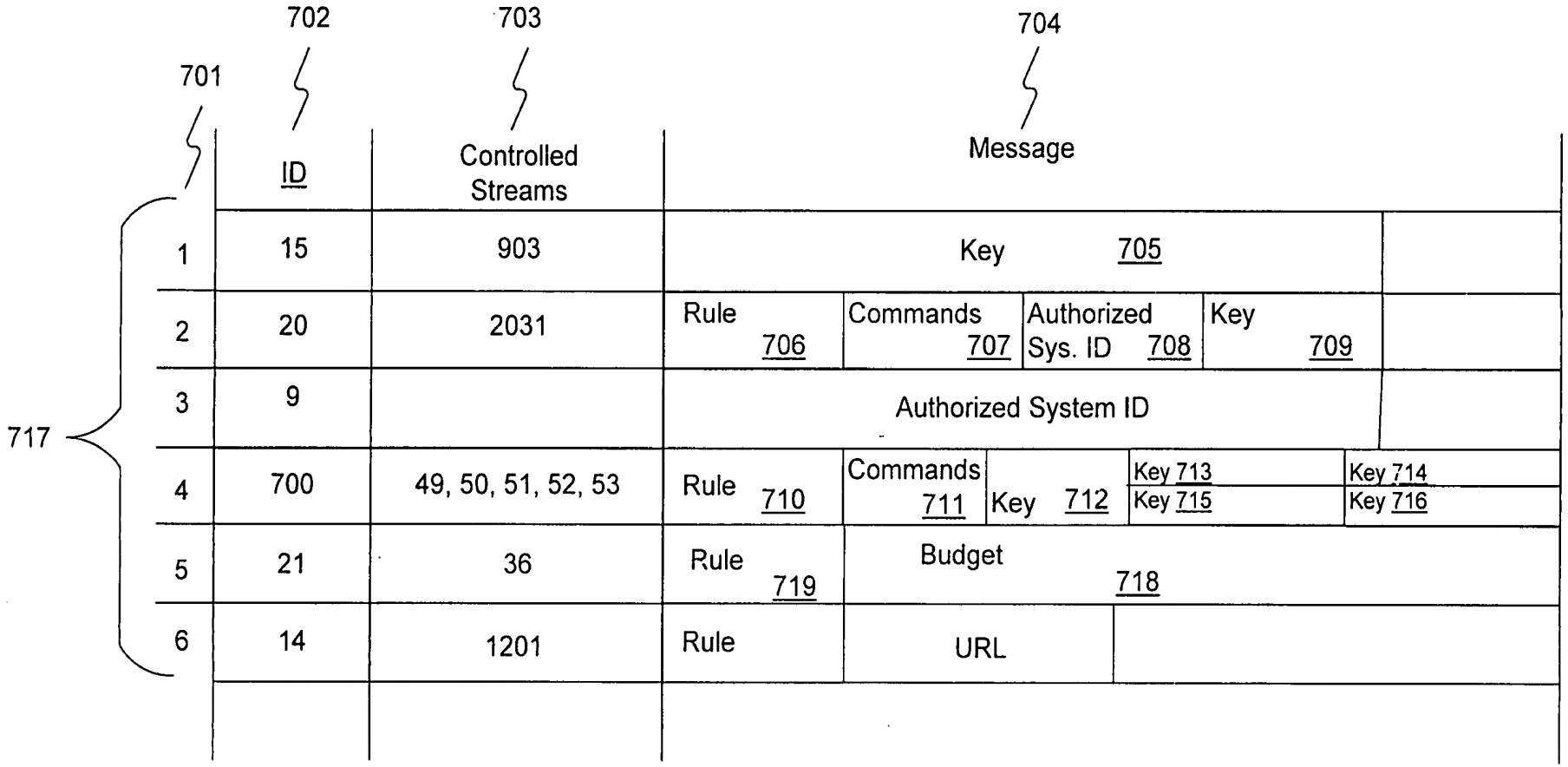

701
702
703
704
ID
Controlled Streams
Message
717
1
15
903
Key 705
2
20
2031
Rule 706
Commands 707
Authorized Sys. ID 708
Key 709
3
9
Authorized System ID
4
700
49, 50, 51, 52, 53
Rule 710
Commands 711
Key 712
Key 713
Key 714
Key 715
Key 716
5
21
36
Rule 719
Budget 718
6
14
1201
Rule
URL

Fig. 7

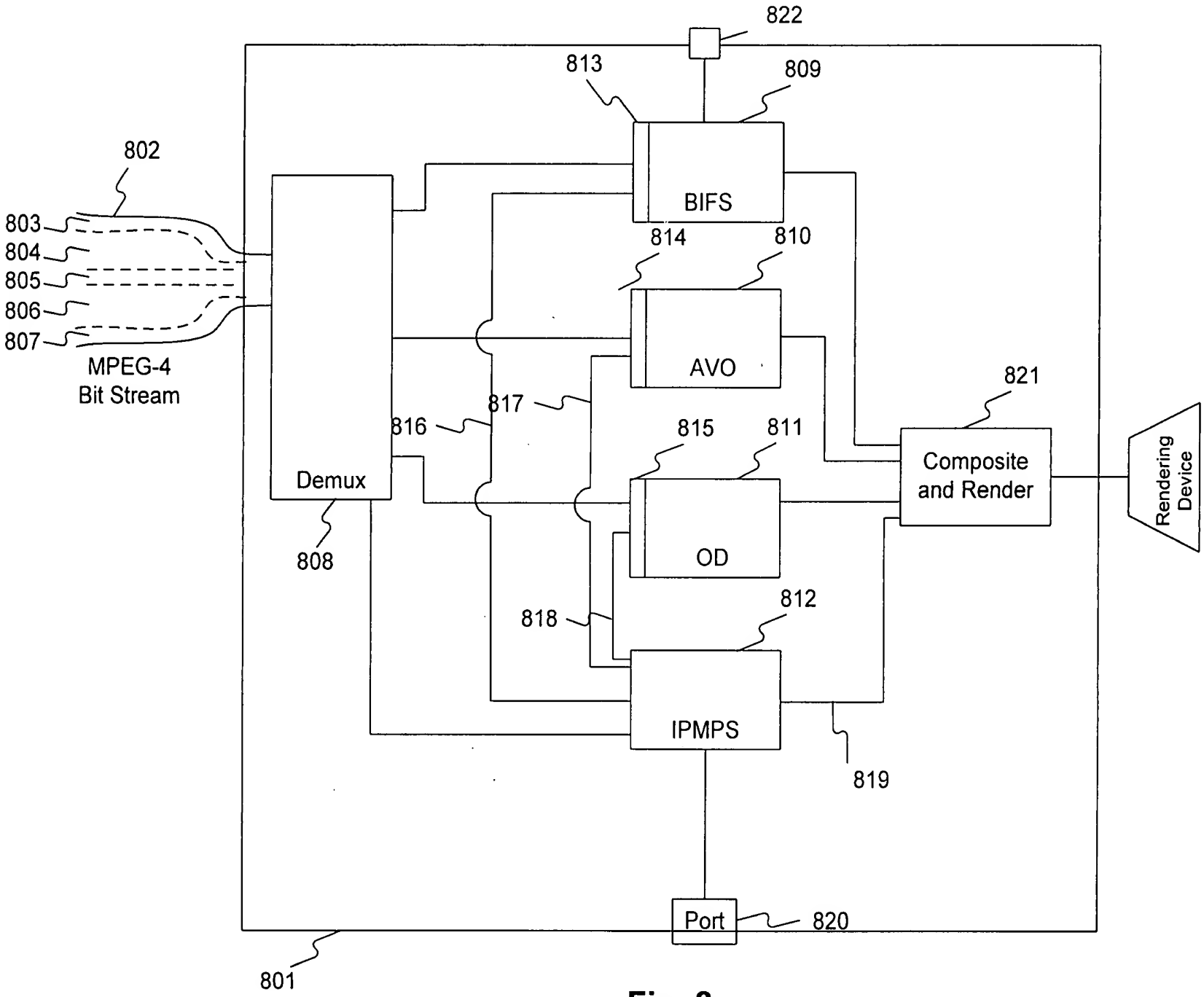


Fig. 8

09276233 .032500

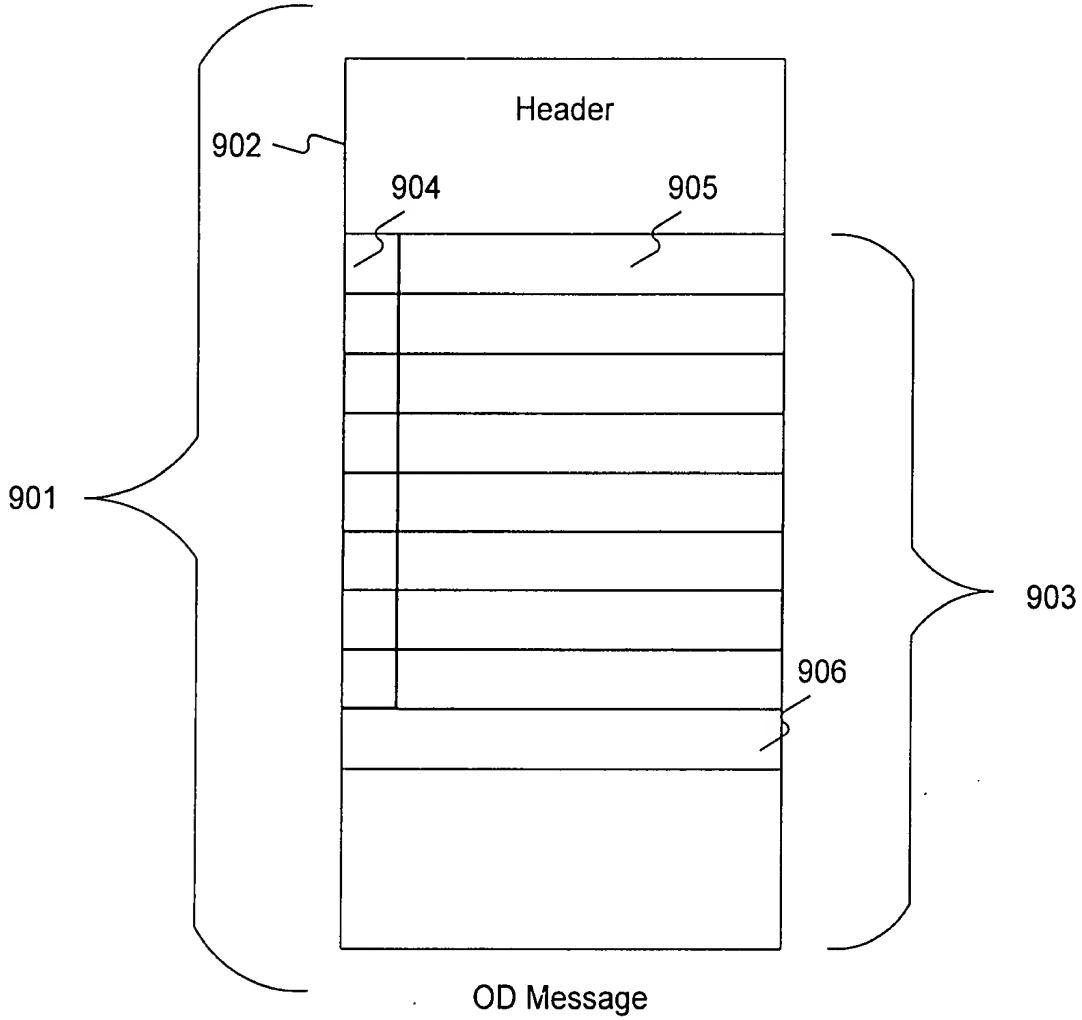


Fig. 9

IPMP Table

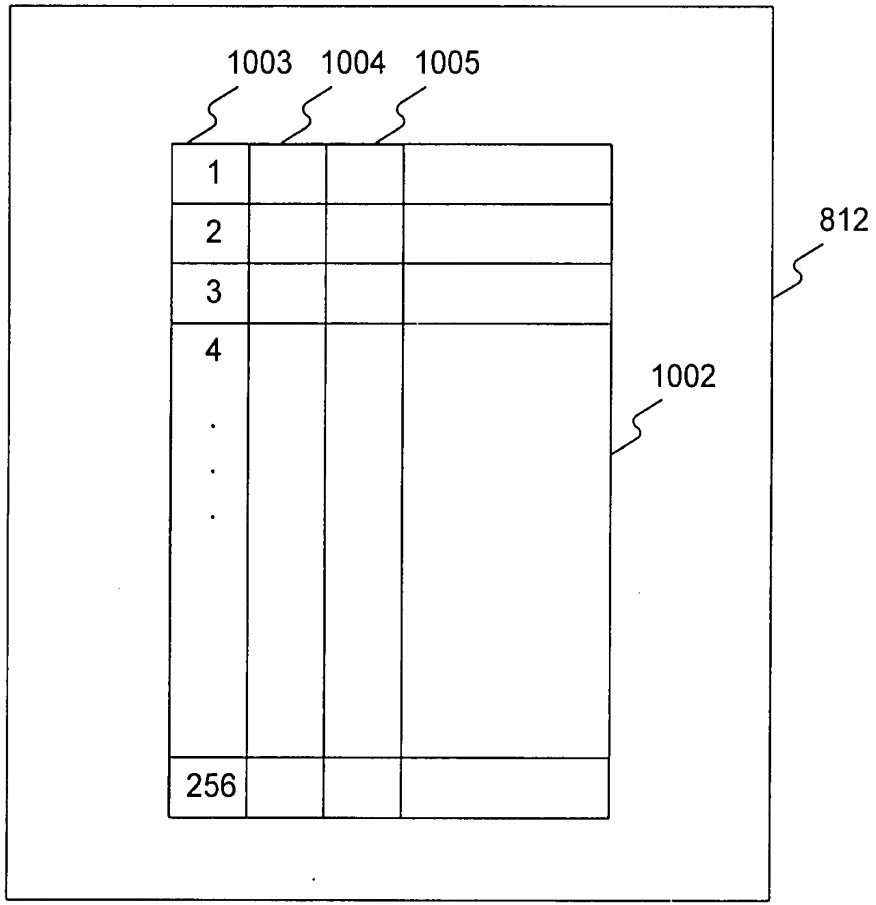


Fig. 10

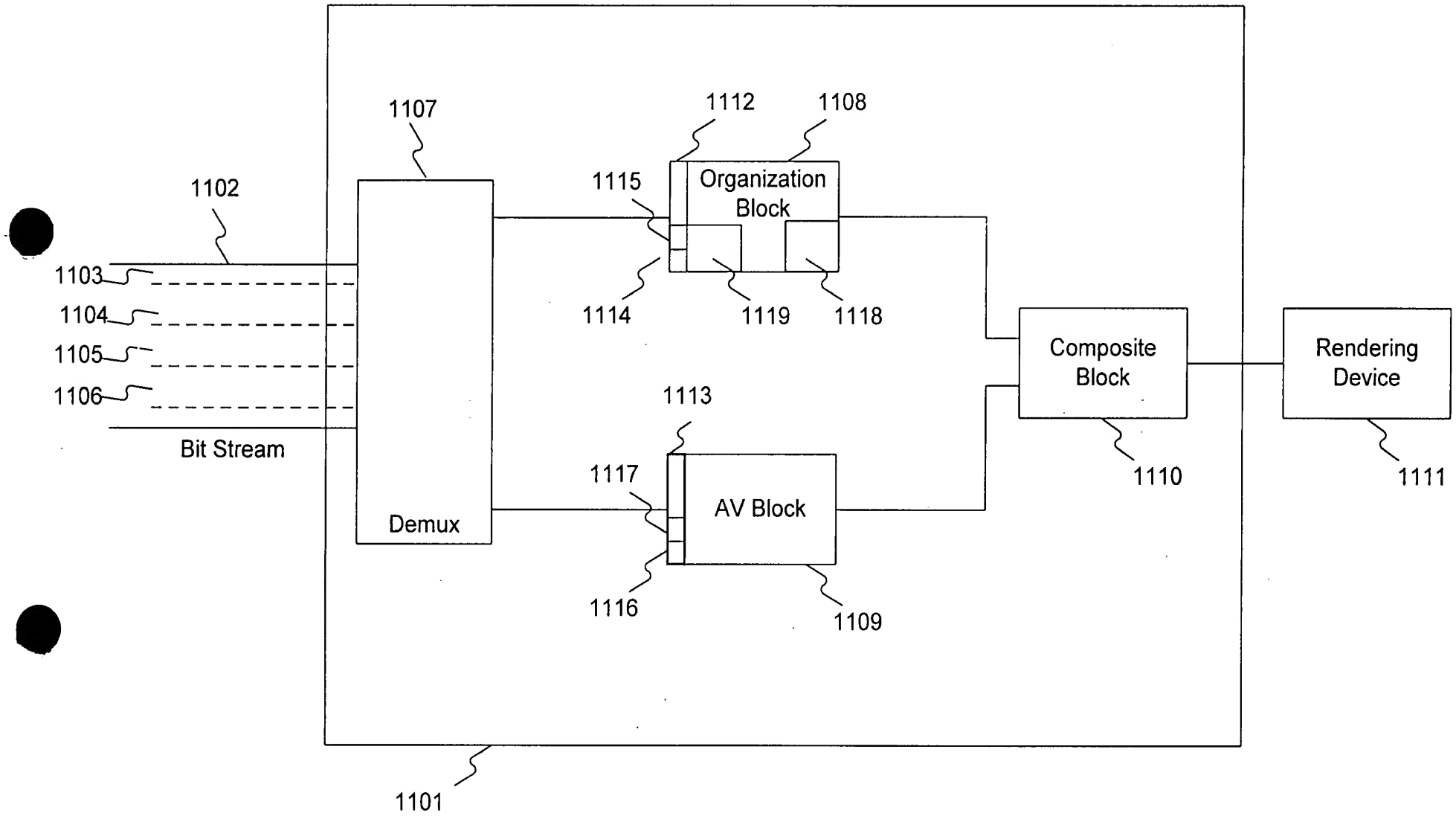

1107
1112
1108
1102
1115
Organization Block
1103
1104
1105
1106
Bit Stream
1114
1119
1118
1113
1117
AV Block
Demux
1116
1109
Composite Block
Rendering Device
1110
1111
1101

Fig. 11

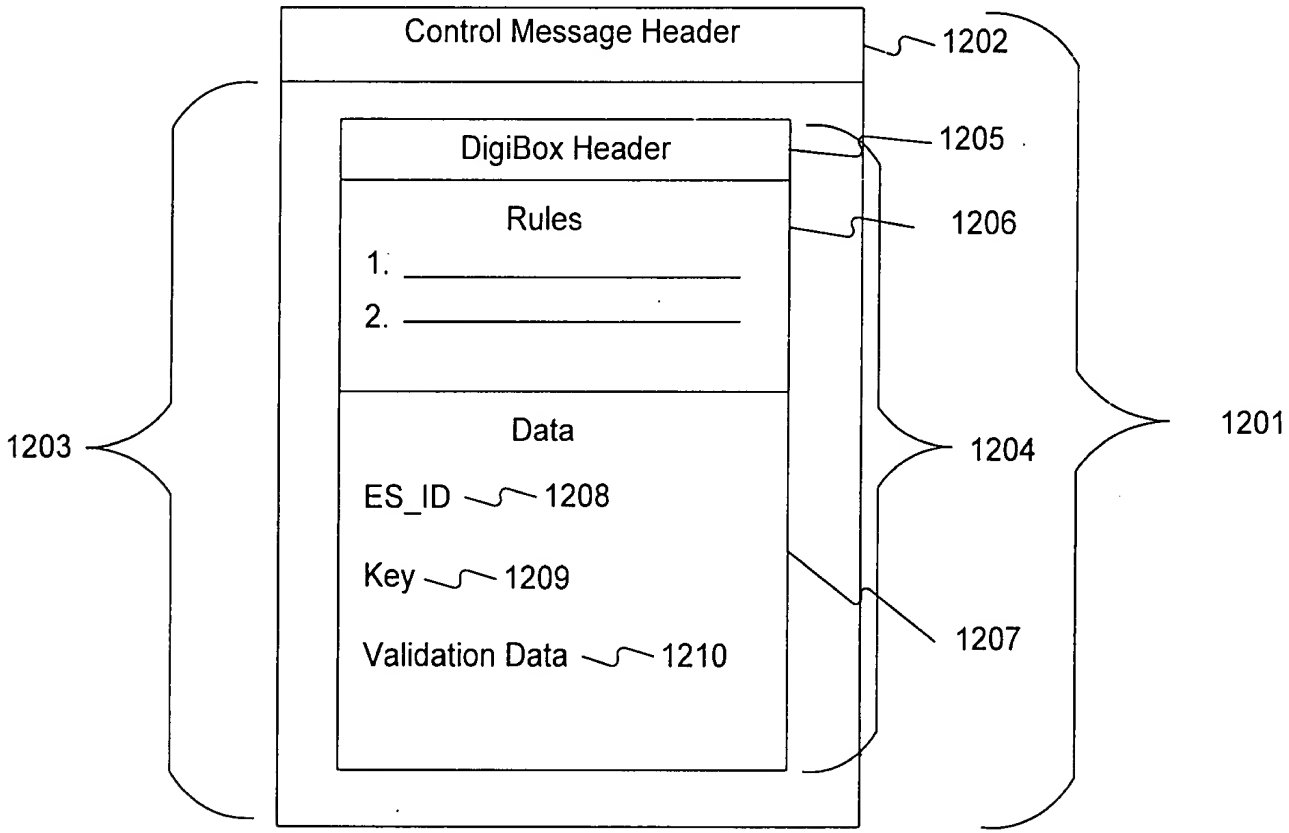

Control Message Header
1202
DigiBox Header
1205
Rules
1206
1.
2.
Data
1203
1204
1201
ES_ID
1208
Key
1209
1207
Validation Data
1210

Fig. 12

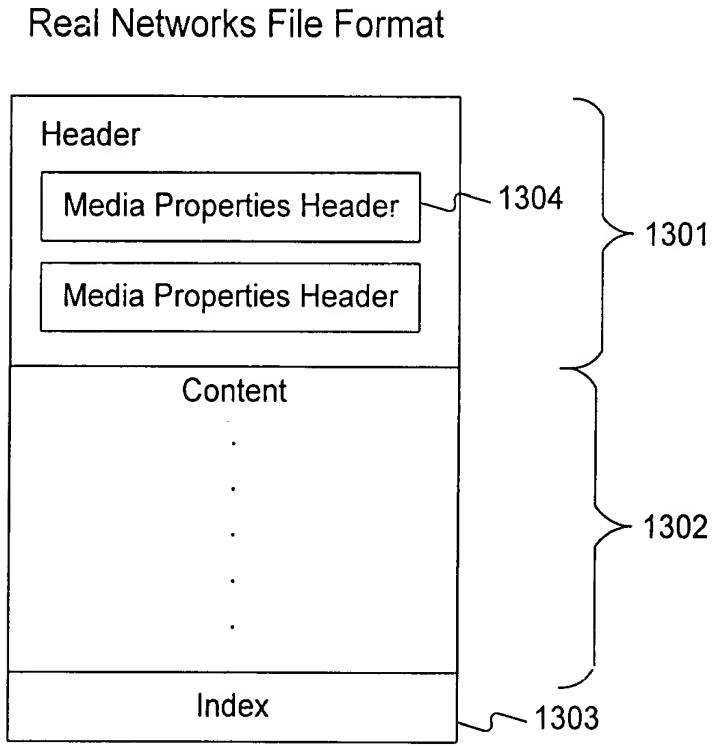


Fig. 13

09276233 .030509

Real Networks/Protected File Format

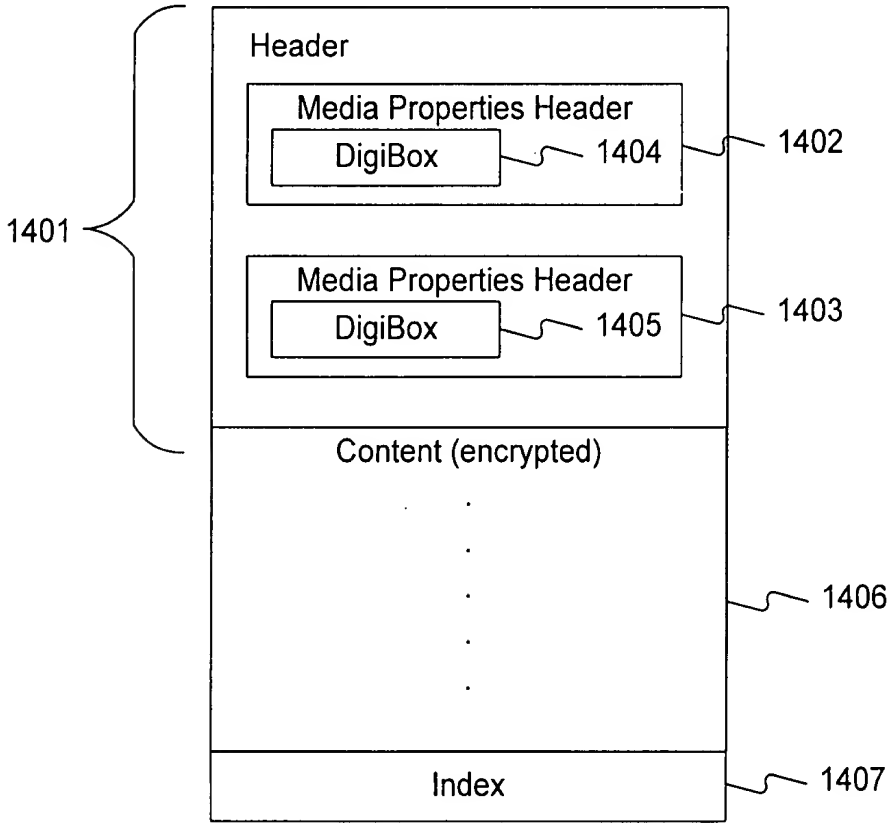


Fig. 14

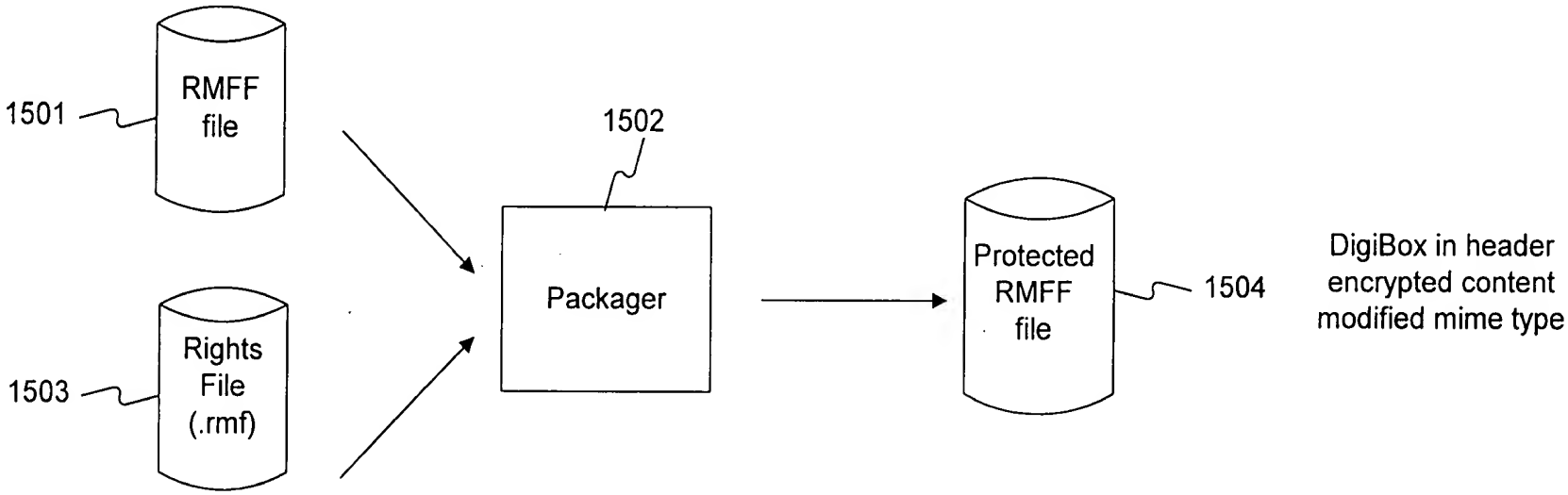


Fig. 15

09276233 .032509

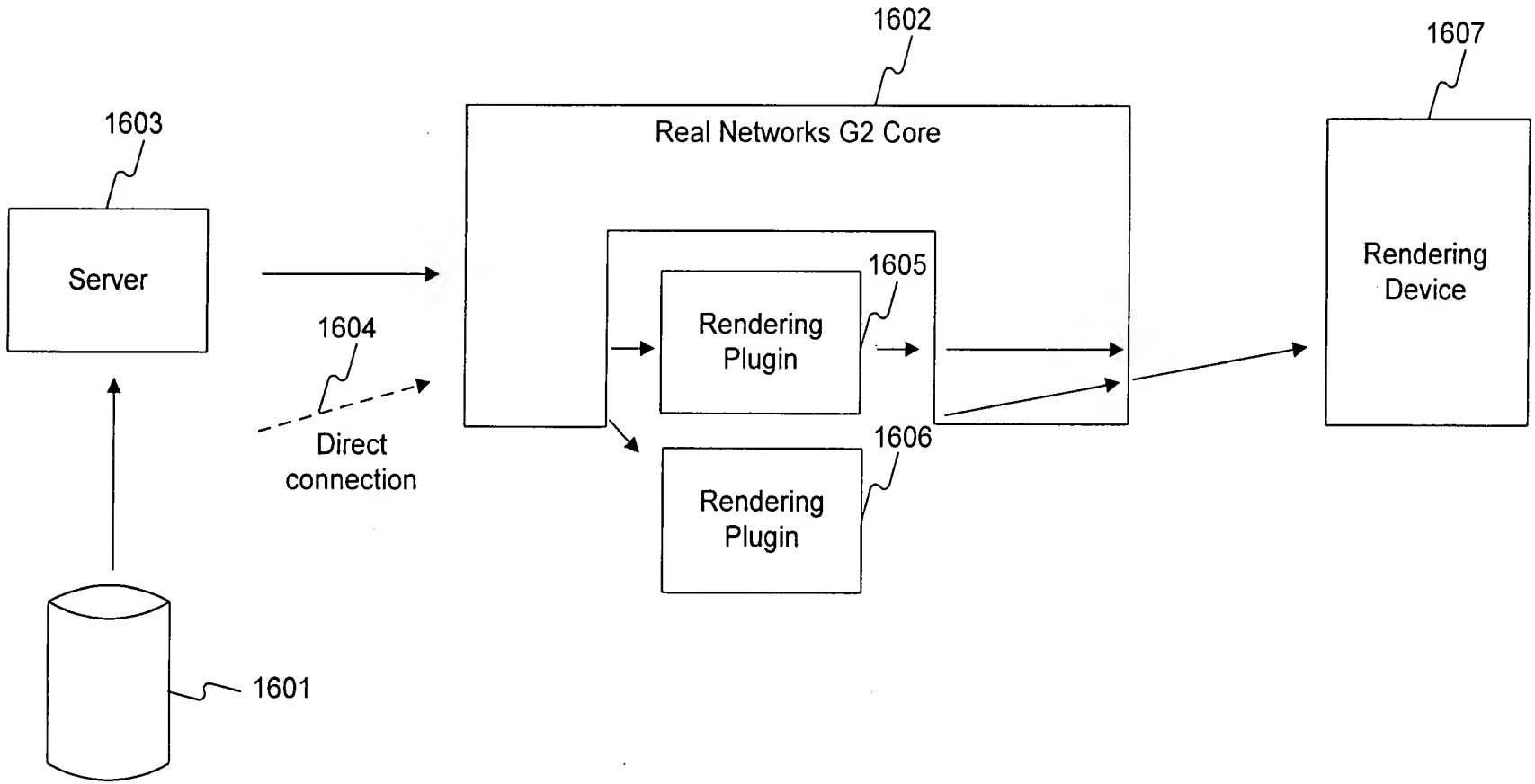


Fig. 16

09276233 .032599

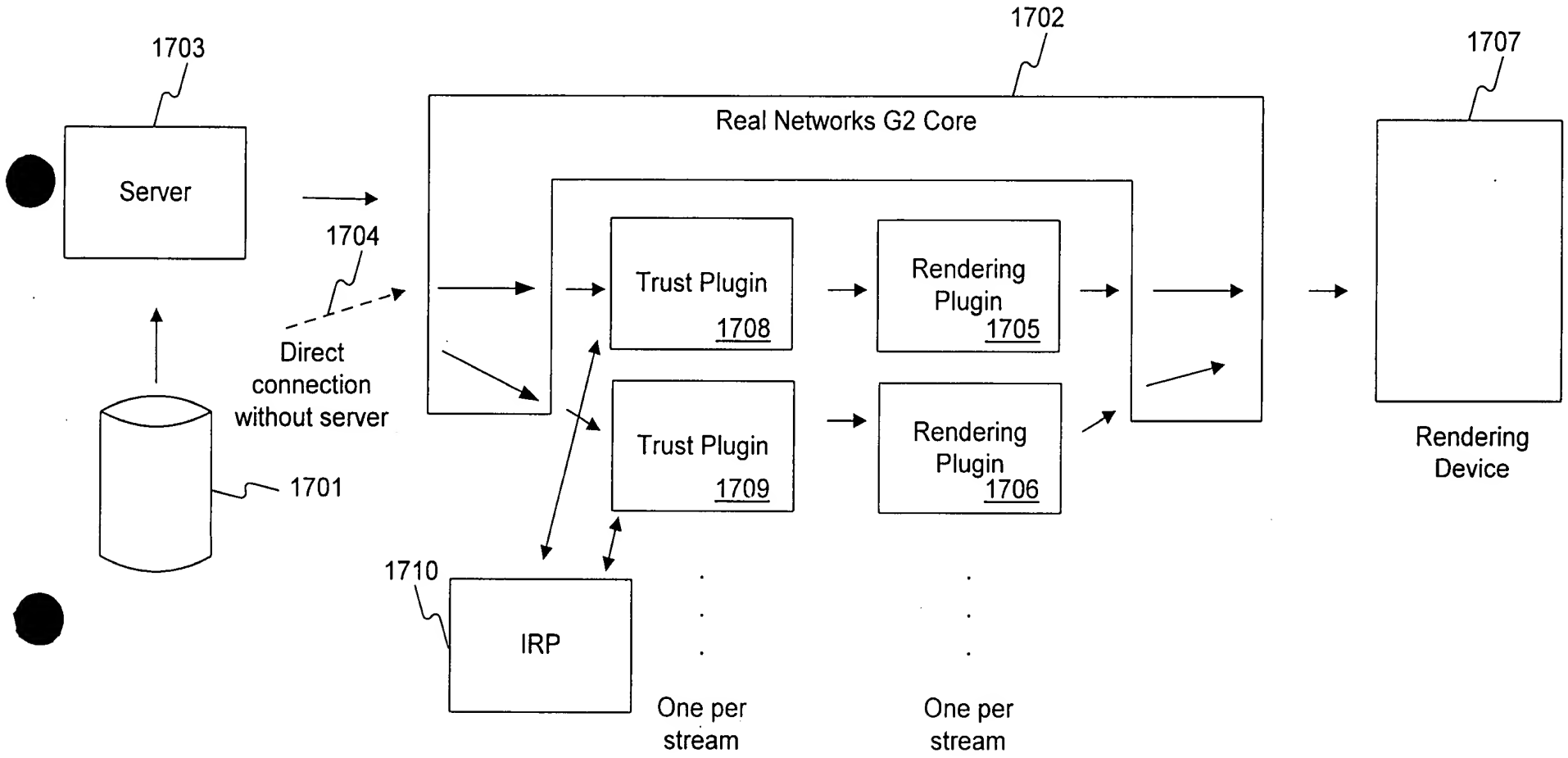


Fig. 17

09276233 .032599

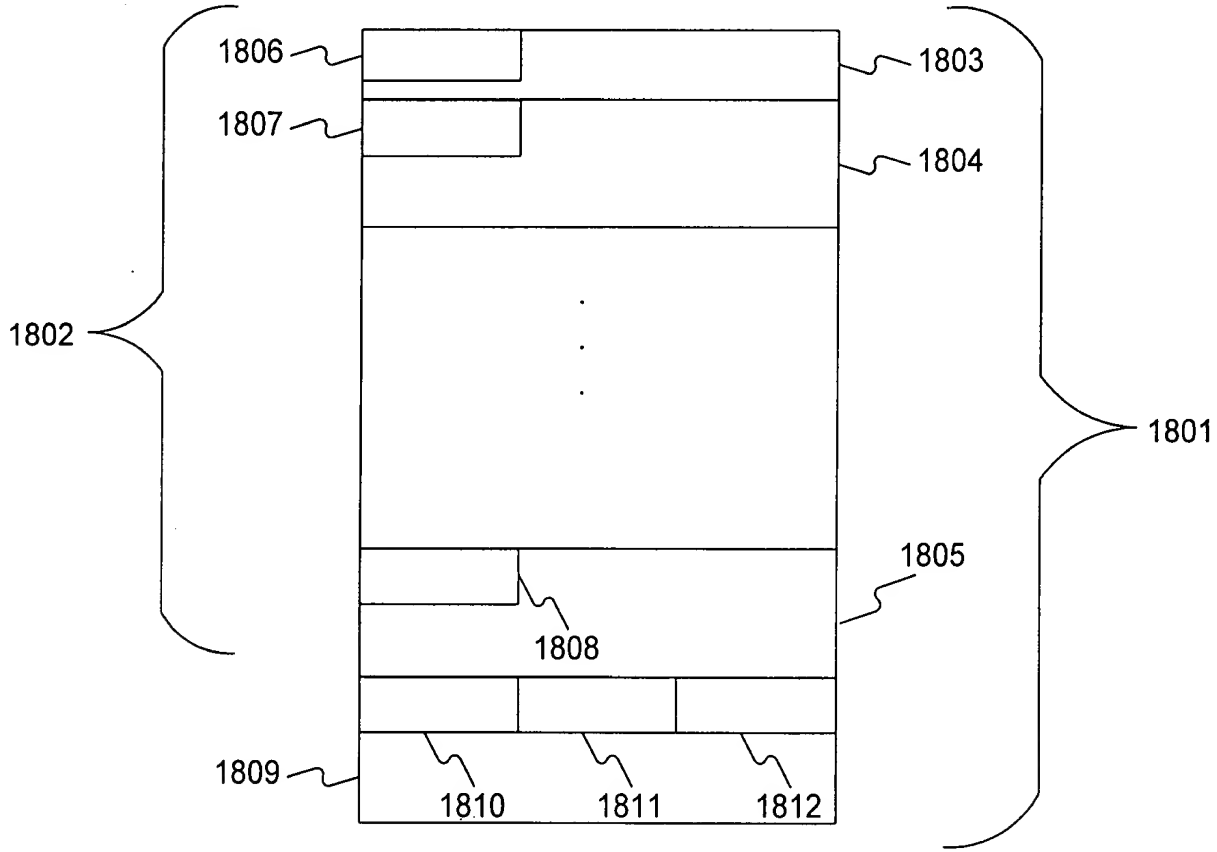
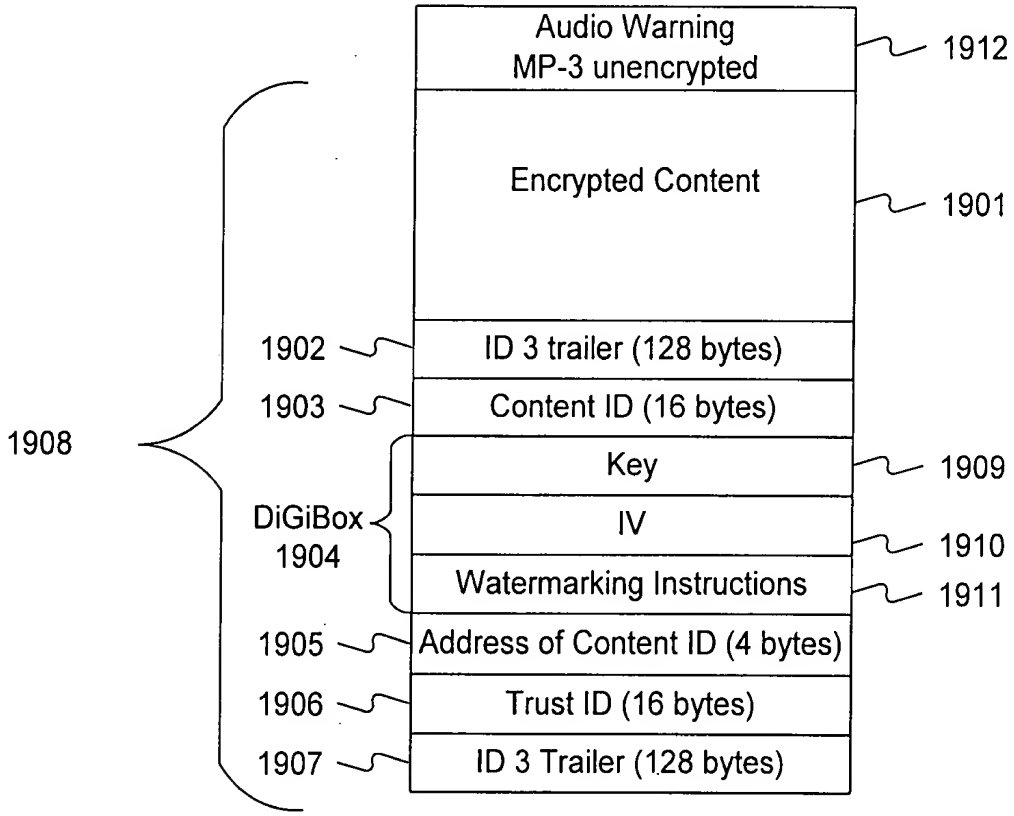


Fig. 18



Protected MP3 Format

Fig. 19

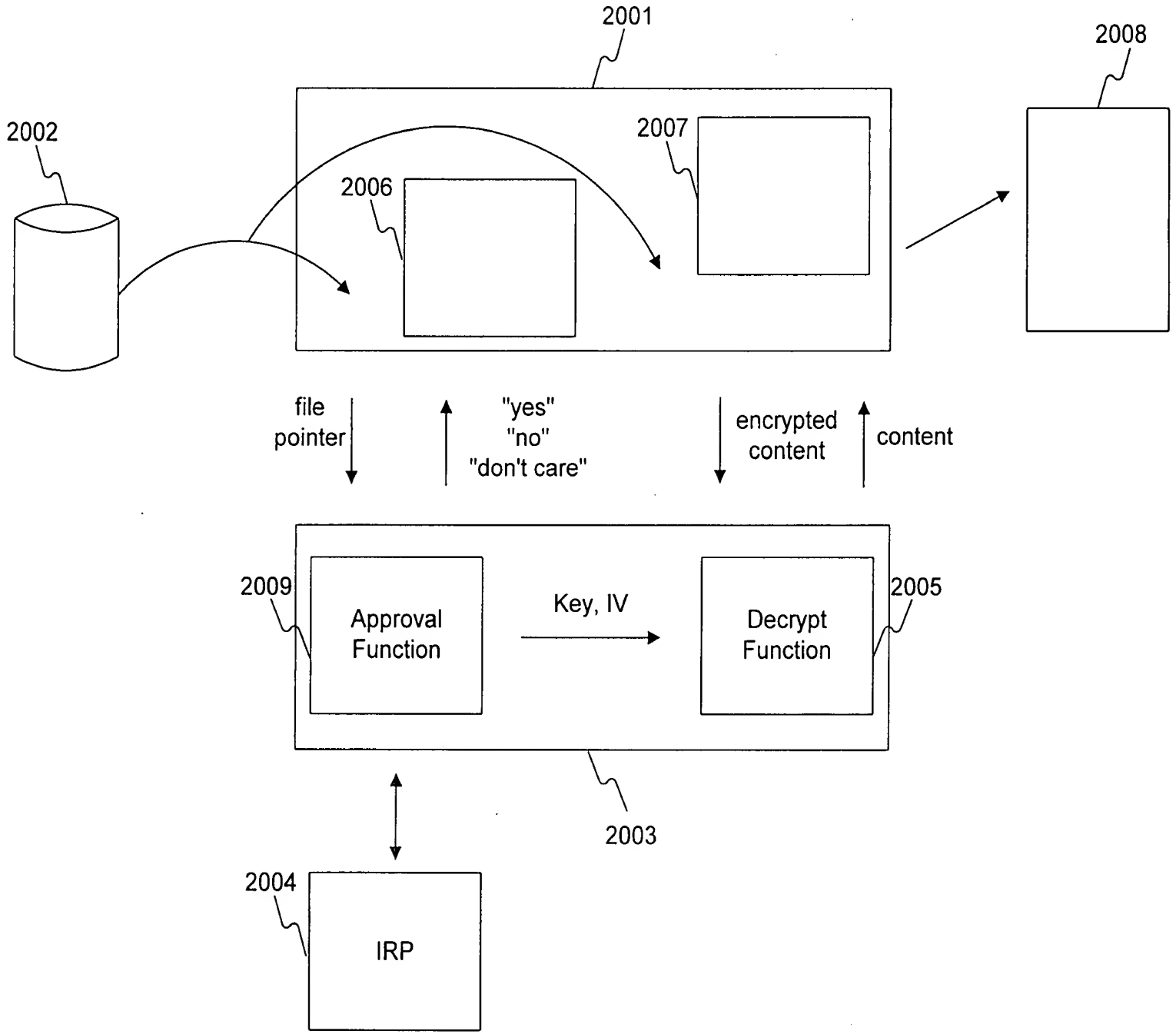


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Fig. 20

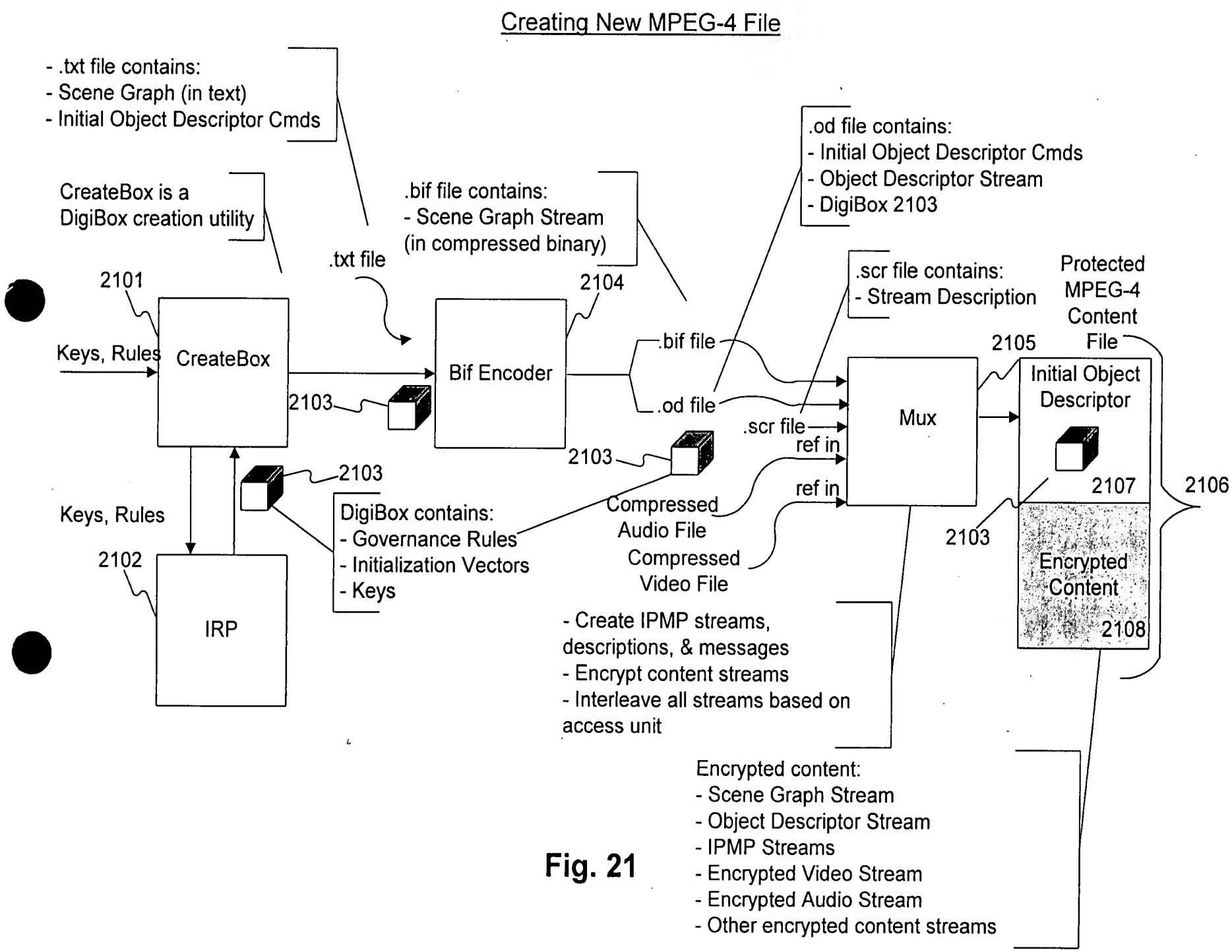
Creating New MPEG-4 File
- .txt file contains:
- Scene Graph (in text)
- Initial Object Descriptor Cmds
CreateBox is a
DigiBox creation utility
.txt file
.bif file contains:
- Scene Graph Stream
(in compressed binary)
.od file contains:
- Initial Object Descriptor Cmds
- Object Descriptor Stream
- DigiBox 2103
.scr file contains:
- Stream Description
Protected
MPEG-4
Content
File
2101
2104
2105
2106
2107
2108
2102
2103
Keys, Rules
CreateBox
Bif Encoder
.bif file
.od file
.scr file
ref in
ref in
Mux
Initial Object
Descriptor
Encrypted
Content
Compressed
Audio File
Compressed
Video File
DigiBox contains:
- Governance Rules
- Initialization Vectors
- Keys
IRP
- Create IPMP streams,
descriptions, & messages
- Encrypt content streams
- Interleave all streams based on
access unit
Encrypted content:
- Scene Graph Stream
- Object Descriptor Stream
- IPMP Streams
- Encrypted Video Stream
- Encrypted Audio Stream
- Other encrypted content streams

Fig. 21

Repackaging Existing MPEG-4 Files

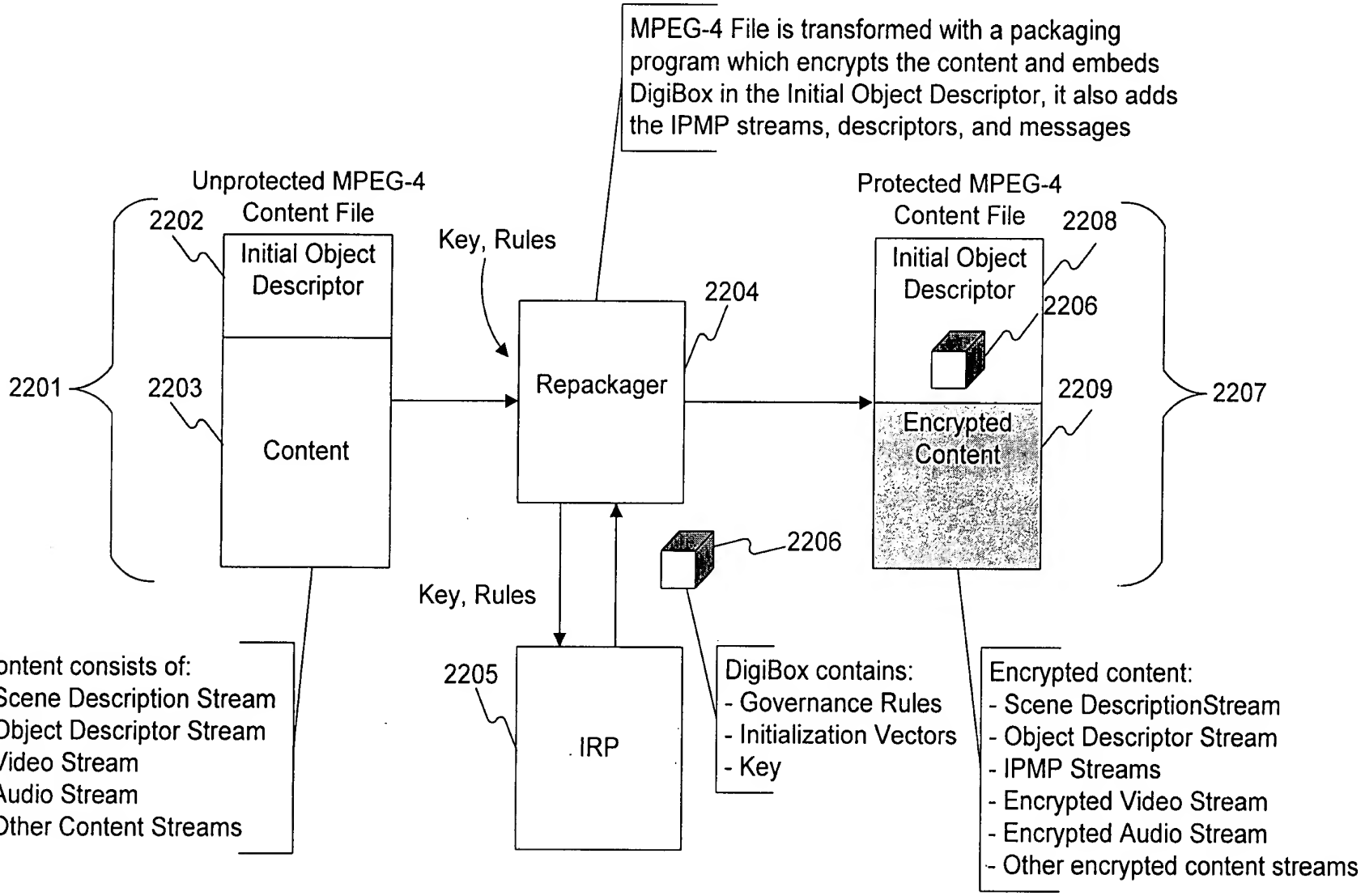

Fig. 22

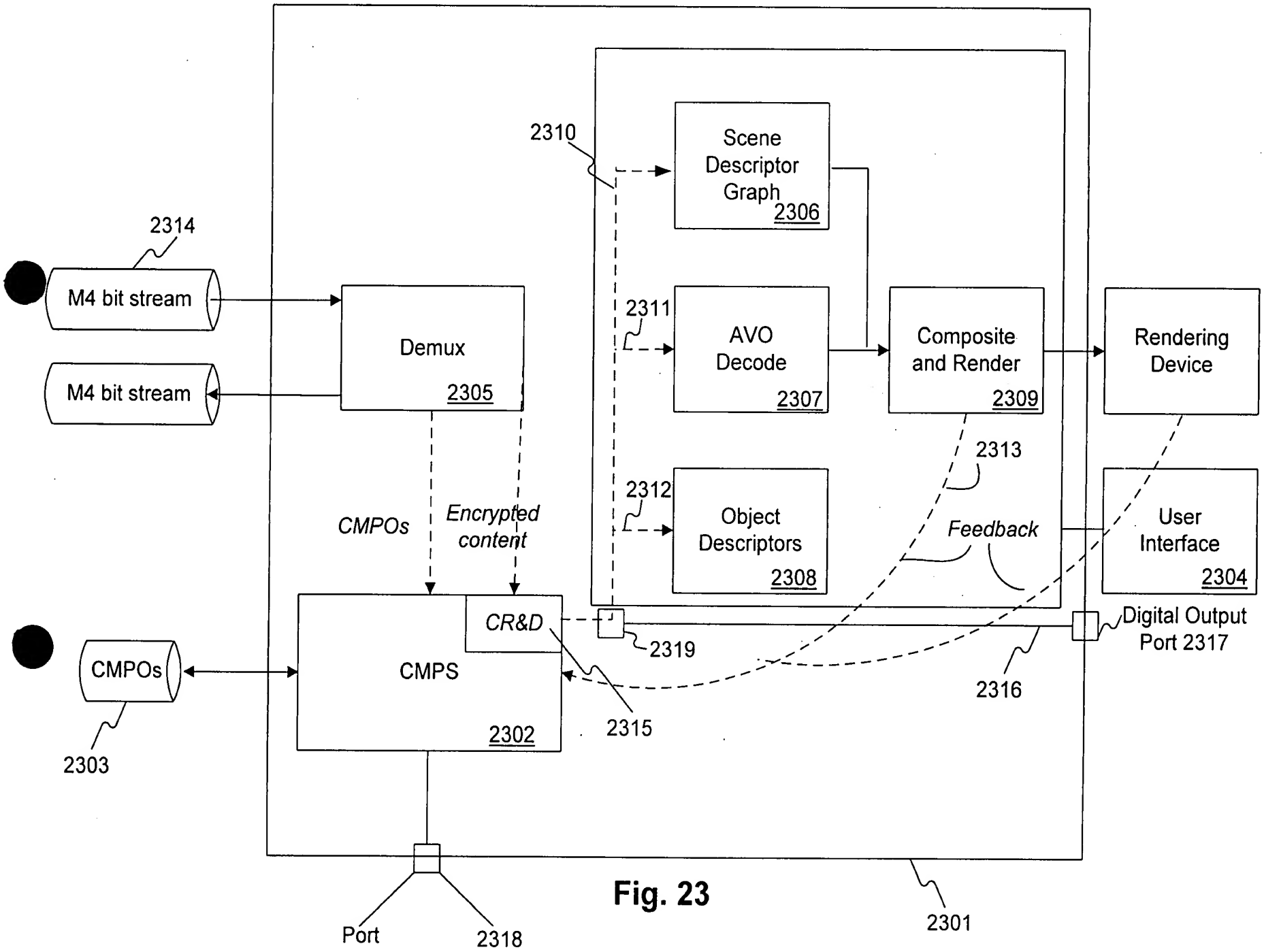

Fig. 23

09276233 .032509

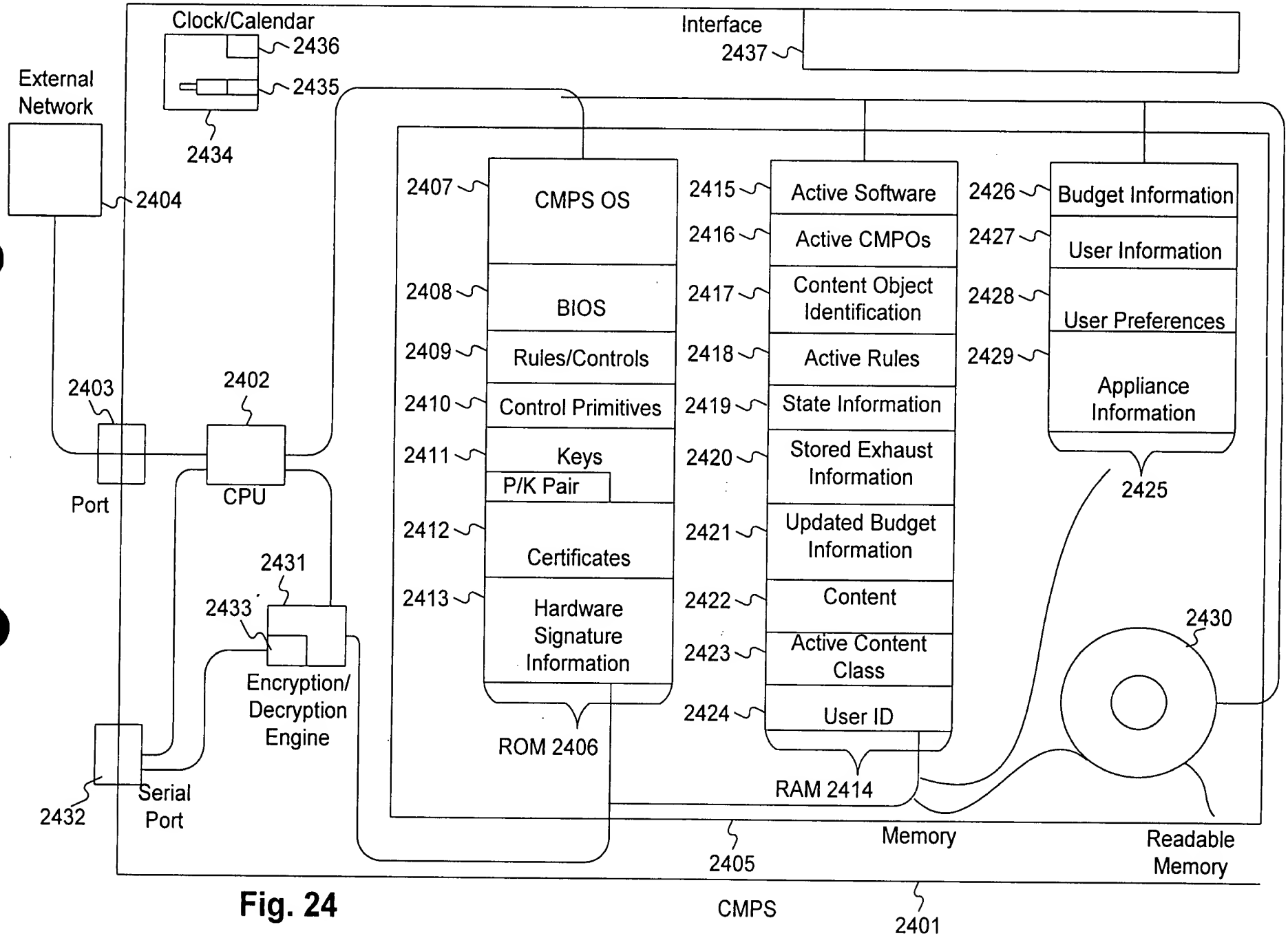
Clock/Calendar
2436
2435
2434
Interface
2437
External Network
2404
2407
CMPS OS
2408
BIOS
2409
Rules/Controls
2410
Control Primitives
2411
Keys
P/K Pair
2412
Certificates
2413
Hardware Signature Information
ROM 2406
2415
Active Software
2416
Active CMPOs
2417
Content Object Identification
2418
Active Rules
2419
State Information
2420
Stored Exhaust Information
2421
Updated Budget Information
2422
Content
2423
Active Content Class
2424
User ID
RAM 2414
2426
Budget Information
2427
User Information
2428
User Preferences
2429
Appliance Information
2425
2403
Port
2402
CPU
2431
2433
Encryption/ Decryption Engine
2430
2432
Serial Port
2405
Memory
Readable Memory
CMPS
2401

Fig. 24

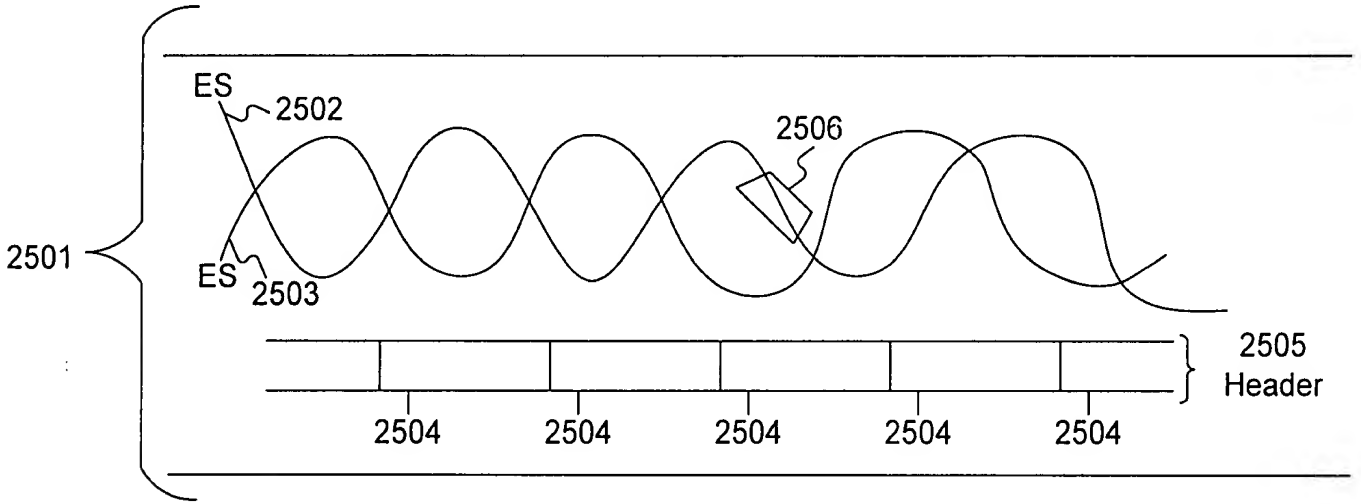
ES
2502
2506
2501
ES
2503
2505
Header
2504
2504
2504
2504
2504
Aggregate Stream

Fig. 25

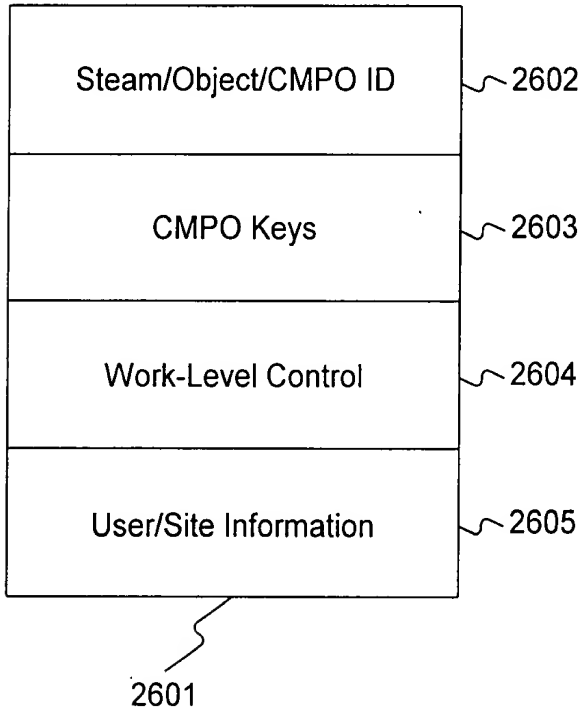

Fig. 26

09276233 .032595

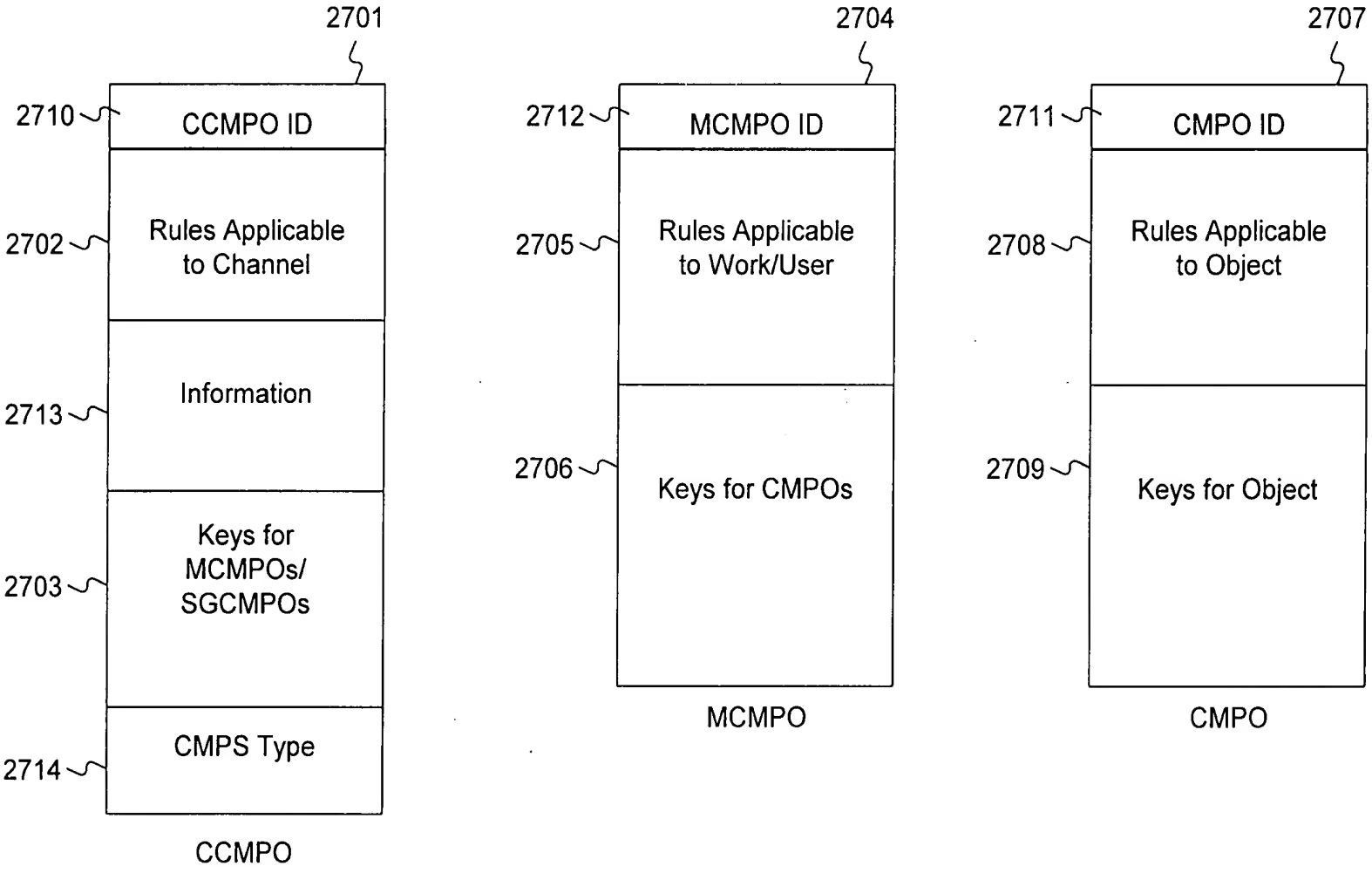

Fig. 27

09276233 .032504

CMPO Structure

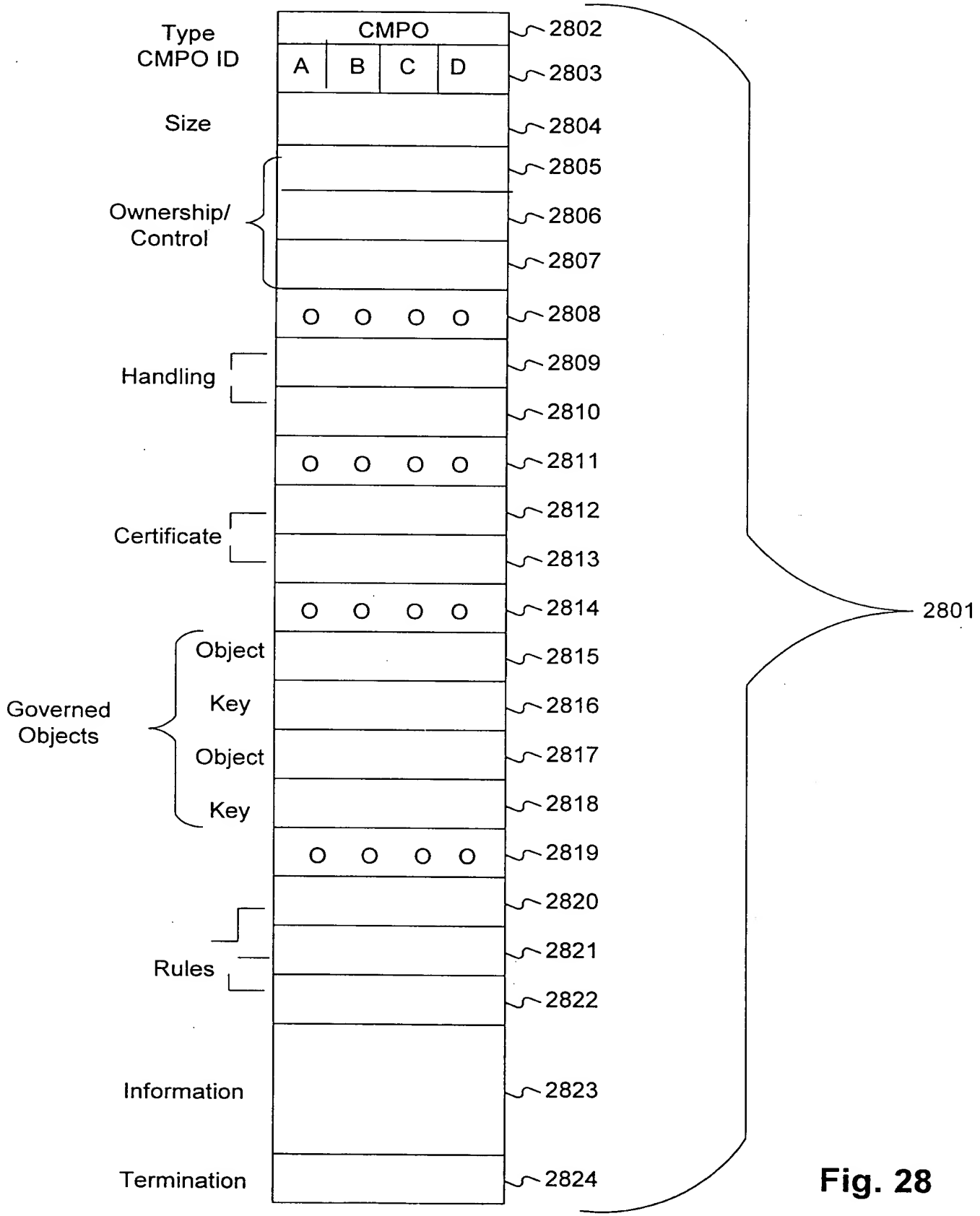

Fig. 28

Docket: 5650.2.2.10

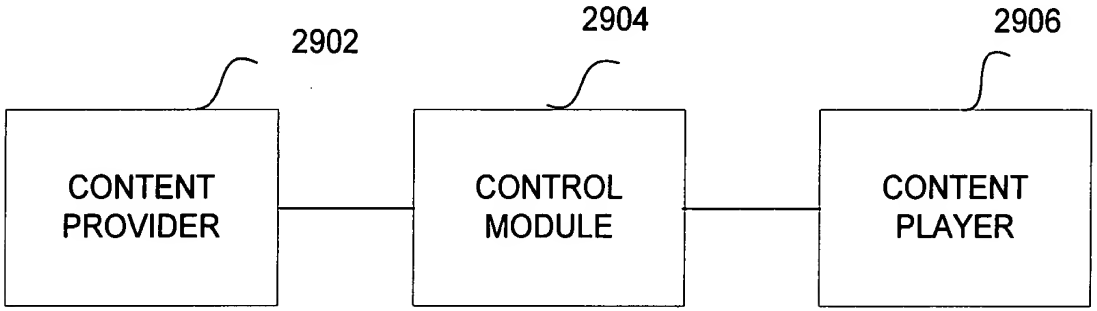
2902
2904
2906
CONTENT PROVIDER
CONTROL MODULE
CONTENT PLAYER

FIG. 29

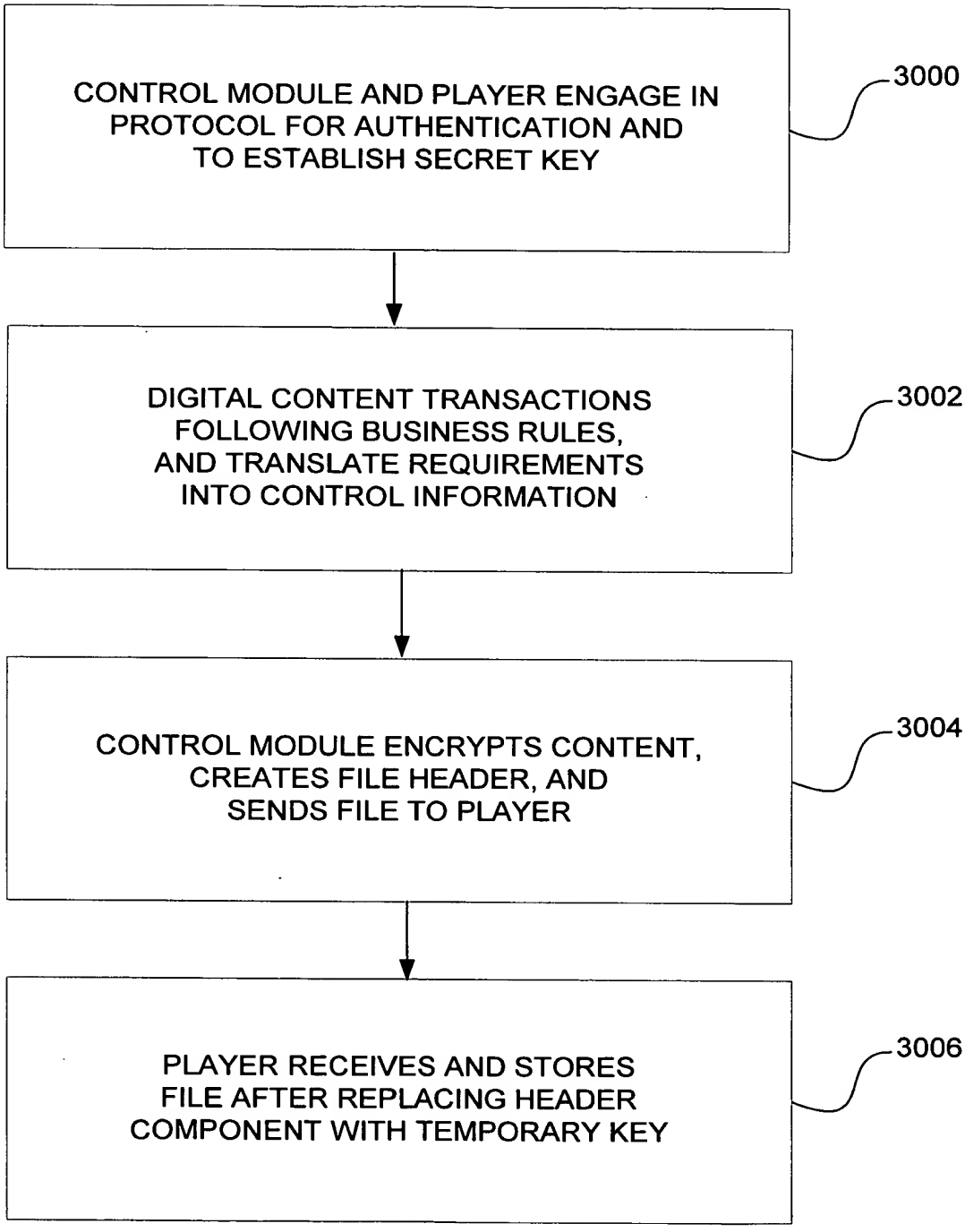

FIG. 30

Date: 6/25/2004 Time: 6:25:59 PM

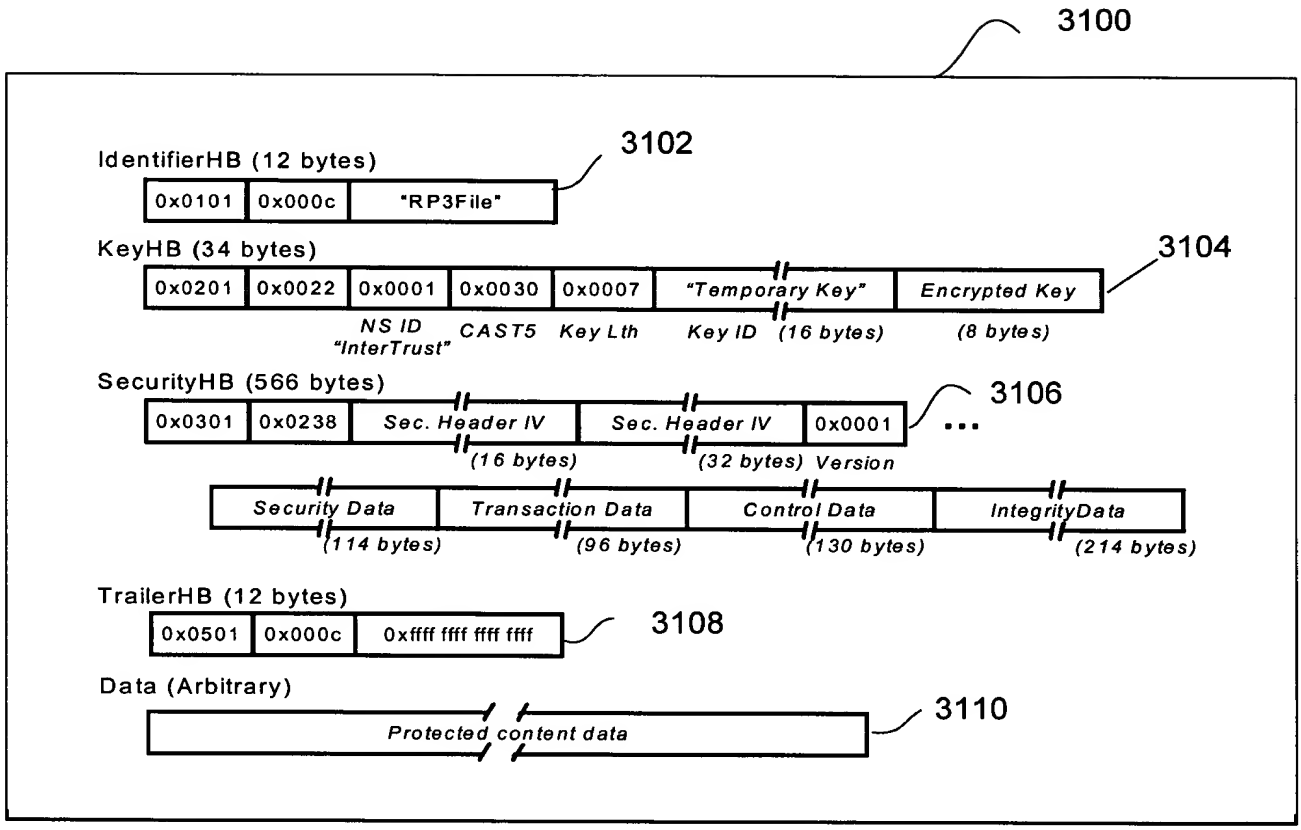
3100
IdentifierHB (12 bytes)
3102
0x0101
0x000c
"RP3File"
KeyHB (34 bytes)
3104
0x0201
0x0022
0x0001
0x0030
0x0007
"Temporary Key"
Encrypted Key
NS ID "InterTrust"
CAST5
Key Lth
Key ID
(16 bytes)
(8 bytes)
SecurityHB (566 bytes)
3106
0x0301
0x0238
Sec. Header IV
Sec. Header IV
0x0001
(16 bytes)
(32 bytes)
Version
Security Data
Transaction Data
Control Data
IntegrityData
(114 bytes)
(96 bytes)
(130 bytes)
(214 bytes)
TrailerHB (12 bytes)
3108
0x0501
0x000c
0xffff ffff ffff ffff
Data (Arbitrary)
3110
Protected content data

FIG. 31

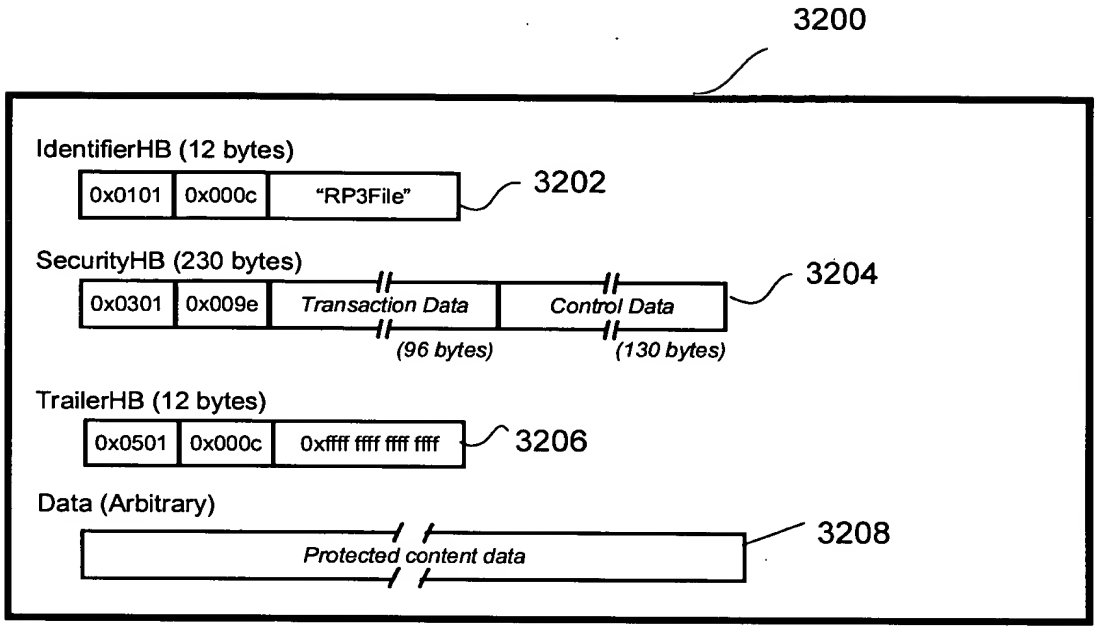
3200
IdentifierHB (12 bytes)
0x0101
0x000c
"RP3File"
3202
SecurityHB (230 bytes)
0x0301
0x009e
Transaction Data
Control Data
3204
(96 bytes)
(130 bytes)
TrailerHB (12 bytes)
0x0501
0x000c
0xffff ffff ffff ffff
3206
Data (Arbitrary)
Protected content data
3208

FIG. 32